Materials Engineering Branch

TIP*

No. 136 Use of Thermal Grease

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In the past, Apiezon H hydrocarbon grease has been used successfully as a thermal interface material on a number of GSFC programs. As there have been changes in the manufacture of this product it should no longer be used. The concern is more fully explained in the previous TIP, No. 135.

However, as one might expect, as with any grease, whether it be a hydrocarbon or a silicone, it will have a tendency to squeeze out when a compressive force is applied. Additional seepage may occur later during thermal vacuum and vibration testing that will require repeated cleanup. Although the hydrocarbon greases, such as Apiezon L and N, seem to do this to a lesser degree than the silicone greases, the concern still persists.

Additionally, if it becomes necessary at some later time to remove a component that has had thermal grease applied, the removal difficulty depends largely on the size of the component and its location. If the component is large and is located in a confined space, removal can be a formidable task. Also, in such cases, there is always the problem of cleanup and reapplication of grease, both of which can be time consuming. These comments are applicable to all thermal greases.

In light of the findings of TIP No. 135and in order to avoid these kinds of problems, it is suggested that an alternate heat transfer material such as Cho-Therm, which can be purchased in sheet form from Chomerics, be considered. Both of the Cho-Therm materials that we have tested, Cho-Therm 1661[1] and 1671, have acceptably low outgassing. They are high temperature cured silicone rubbers that are filled with boron nitride and fiberglass. The thermal conductivity of both products is given by Chomerics as 2.6 W/m-K, but it should be verified by the user.

[1] Cho-Therm 1661 has been discontinued. Cho-Therm 1671 is the recommended substitute.